

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number  
WO 2004/051738 A3

(51) International Patent Classification<sup>7</sup>: H01L 21/762, (74) Agent: RAAP, Adriaan, Y.; Philips Intellectual Property  
21/68, 21/306, 21/78, 27/15, 27/32 & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven  
(NL).

(21) International Application Number:  
PCT/IB2003/004937

(22) International Filing Date: 31 October 2003 (31.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
02080057.9 3 December 2002 (03.12.2002) EP

(71) Applicant (for all designated States except US): KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL];  
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LIFKA, Herbert [AT/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). KUIPER, Stein [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,

AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,  
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,  
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,  
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,  
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

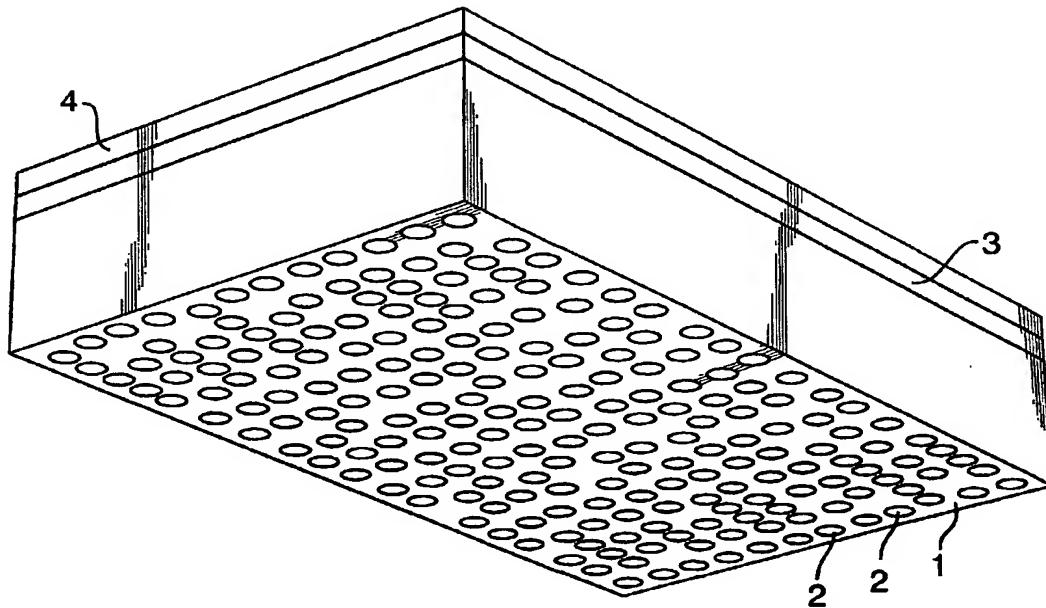
(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted  
a patent (Rule 4.17(ii)) for the following designations AE,  
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,

[Continued on next page]

(54) Title: METHOD FOR THE MANUFACTURE OF A DISPLAY



(57) Abstract: A method for the manufacture of displays, in particular flexible displays, is disclosed. A substrate (1) provided with small openings (2), rendering the substrate porous and forming trenches in the substrate (1), is used. A removable layer (3) is attached to the substrate (1). An etch and temperature resistant layer (4) is deposited onto the removable layer (3), and a display is processed on said etch and temperature resistant layer (4). The removable layer (3) is removed by etching through the openings (2) in the substrate (1) and the substrate may be re-used.

WO 2004/051738 A3



*CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(88) Date of publication of the international search report:**  
2 September 2004

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

tional Application No  
PCT/IB 03/04937

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H01L21/762 H01L21/68 H01L21/306 H01L21/78 H01L27/15 H01L27/32																			
According to International Patent Classification (IPC) or to both national classification and IPC																			
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 H01L																			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																			
Electronic data base consulted during the International search (name of data base and, where practical, search terms used)  EPO-Internal																			
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Category *</th> <th style="text-align: left; padding: 2px;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="text-align: left; padding: 2px;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 2px;">X</td> <td style="padding: 2px;">WO 00/45426 A (HORZEL JOERG ;INTERUNIVERSITAIRE MICROELEKTR (BE); VAZSONYI EVA (H) 3 August 2000 (2000-08-03) cited in the application page 9, line 5 -page 10, line 19; figures 1A-N page 15, line 31 -page 16, line 31</td> <td style="text-align: center; padding: 2px;">1,3,4,6, 7,14-18</td> </tr> <tr> <td style="text-align: center; padding: 2px;">X</td> <td style="padding: 2px;">US 5 665 607 A (KAWAMA YOSHITATSU ET AL) 9 September 1997 (1997-09-09)</td> <td style="text-align: center; padding: 2px;">1-3,5,6, 14,15, 17,18</td> </tr> <tr> <td style="text-align: center; padding: 2px;">Y</td> <td style="padding: 2px;">column 13, line 43 -column 16, line 14; figures 2A-G</td> <td style="text-align: center; padding: 2px;">8-13</td> </tr> <tr> <td style="text-align: center; padding: 2px;">Y</td> <td style="padding: 2px;">GB 1 515 031 A (IBM) 21 June 1978 (1978-06-21) page 1, line 55 - line 67; figures 1-6</td> <td style="text-align: center; padding: 2px;">8-13</td> </tr> <tr> <td></td> <td style="text-align: center; padding: 2px;">-/-</td> <td></td> </tr> </tbody> </table>		Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	WO 00/45426 A (HORZEL JOERG ;INTERUNIVERSITAIRE MICROELEKTR (BE); VAZSONYI EVA (H) 3 August 2000 (2000-08-03) cited in the application page 9, line 5 -page 10, line 19; figures 1A-N page 15, line 31 -page 16, line 31	1,3,4,6, 7,14-18	X	US 5 665 607 A (KAWAMA YOSHITATSU ET AL) 9 September 1997 (1997-09-09)	1-3,5,6, 14,15, 17,18	Y	column 13, line 43 -column 16, line 14; figures 2A-G	8-13	Y	GB 1 515 031 A (IBM) 21 June 1978 (1978-06-21) page 1, line 55 - line 67; figures 1-6	8-13		-/-	
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																	
X	WO 00/45426 A (HORZEL JOERG ;INTERUNIVERSITAIRE MICROELEKTR (BE); VAZSONYI EVA (H) 3 August 2000 (2000-08-03) cited in the application page 9, line 5 -page 10, line 19; figures 1A-N page 15, line 31 -page 16, line 31	1,3,4,6, 7,14-18																	
X	US 5 665 607 A (KAWAMA YOSHITATSU ET AL) 9 September 1997 (1997-09-09)	1-3,5,6, 14,15, 17,18																	
Y	column 13, line 43 -column 16, line 14; figures 2A-G	8-13																	
Y	GB 1 515 031 A (IBM) 21 June 1978 (1978-06-21) page 1, line 55 - line 67; figures 1-6	8-13																	
	-/-																		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.																			
<input checked="" type="checkbox"/> Patent family members are listed in annex.																			
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed																			
*T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art *Z* document member of the same patent family																			
Date of the actual completion of the International search	Date of mailing of the International search report																		
28 June 2004	06/07/2004																		
Name and mailing address of the ISA  European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax. (+31-70) 340-3016	Authorized officer  Dauw, X																		

# INTERNATIONAL SEARCH REPORT

Int'l Search Application No.  
PCT/IB 03/04937

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 196 54 791 A (MITSUBISHI ELECTRIC CORP) 25 September 1997 (1997-09-25) figure 10 ----	1-18
A	GB 1 475 656 A (IBM) 1 June 1977 (1977-06-01) page 2, line 117 - line 126; figures 1,2 page 4, line 121 -page 5, column 2 ----	8-13
A	US 5 362 671 A (MCCLELLAND ROBERT ET AL) 8 November 1994 (1994-11-08) figures 10-12 ----	1-18

## INTERNATIONAL SEARCH REPORT

Int'l. Application No. PCT/IB 03/04937

**INTERNATIONAL SEARCH REPORT**

Int'l Application No.  
PCT/IB 03/04937

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5362671	A	US 5743614 A	28-04-1998
		US 5757445 A	26-05-1998
		US 6627953 B1	30-09-2003
		US 5661371 A	26-08-1997
		US 2004070697 A1	15-04-2004
		US 6521940 B1	18-02-2003
		US 5258320 A	02-11-1993
		US 5317236 A	31-05-1994
		US 5258325 A	02-11-1993
		US 5317436 A	31-05-1994
		US 5376561 A	27-12-1994
		US 5444557 A	22-08-1995
		US 5256562 A	26-10-1993
		US 5861929 A	19-01-1999
		US 5331149 A	19-07-1994
		US 6424020 B1	23-07-2002